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ABSTRACT

Drawing from research on reading, this paper suggests various methods of stimulating cognition in beginning readers. Defining cognition as the process by which a person gains knowledge, or understands or comprehends, discussion in the paper centers on the following topics: (1) perceptive and cognitive skills; (2) prior experience; (3) knowledge of the code of writing; (4) motivation, purpose, and interest; (5) perceptibility; (6) adequacy and completeness of coding system; (7) time spent on comprehension instruction; (8) holistic and subskill instructional approaches; (9) questions to guide comprehension; (10) think-time; (11) subskill instruction; and (12) semantic webbing. (HOD)

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STIMULATING COGNITIVE PROCESSES

IN

BEGINNING READERS

Mary Ann Morgan

Nancy Wallace

April 3, 1981

CS 007 223

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STIMULATING COGNITIVE PROCESSES IN BEGINNING READERS

As teachers of beginning readers, we are interested in helping our students to understand the ideas represented by the printed symbols and also to help them to go beyond the material read to more complex, higher levels of understanding. In an effort to ascertain how to help them attain these higher levels of thinking, we investigated various methods of stimulating cognition as it applies to reading. The research we have done on this subject is by no means comprehensive. There are many methods of stimulating cognition in beginning readers. We have chosen few of them and of these few we have chosen to briefly survey some and to explain others in greater detail.

Cognition is the process by which a person gains knowledge or understands or comprehends. Comprehension in reading is generally defined as getting meaning from print.[1] It is not just remembering (recalling, recognizing, or restating). It is remembering and understanding. If a child can repeat a sentence which he has read, this does not prove that he understands the idea expressed by the printed material. For example, if a child reads a sentence which uses the word "synonym," pronounces is correctly, and is able to repeat the sentence, but when asked what the word "synonym" means replies that it is something his mother puts in pies, then he obviously has not understood the meaning expressed by the printed symbols.

Word identification, deriving the correct meaning, and language competency are important, but one can be skilled in these and still not understand.[2]

Word recognition is a prerequisite to comprehension, not a guarantee. Comprehension is dependent on processing meaning rather than words.[3] A good reader comprehends a writer's meanings more fully and exactly than a poor reader. However, the nature of human communication prohibits exact meanings from being transferred from one person to another, except in the very simplest sense. The intended meanings of a writer are not always what the reader comprehends. Comprehension may be incomplete or distorted.

Comprehension is only one of the several skills necessary to make up the process of reading. A person must be able to perceive the elements of the code of writing and be able to discriminate among them. He must be able to decode the various elements according to the system used for their original coding. He must have a firm grasp of the written code. He must associate his past experience with the elements of the code by attaching meaning to these elements. He must be able to relate these elements to gain the significance intended by the author.

The factors necessary for comprehension fall into two main categories: Those related to the characteristics of the person doing the reading and those related to the nature of the material being read.

The characteristic of the reader are:

1. Adequately functioning perceptive and cognitive skills
2. sufficient prior experience related to the coded message,
3. knowledge of the code of writing
4. motivation, purpose and interest.

The characteristics of the reading material are:

1. perceptibility of the coded message
2. adequacy and completeness of coding systems
3. readability
4. the author's unstated meanings.

PERCEPTIVE AND COGNITIVE SKILLS

In order to read an alphabetic code, such as English, two senses are necessary - seeing and hearing. A person blind from birth can learn to read, but he does so by substituting the sense of touch for eyesight. Braille, a form of writing designed for the blind, employs patterns of raised dots instead of graphic letters. A person deaf from birth has more difficulty learning to read because written English is largely a phonetic code that depends on spoken language for its meaning. Any piece of writing is the alphabetic representation of a spoken sound.

Although sight and hearing are important perceptive skills in reading, they are not the only skills needed for comprehension. Cognitive skills, such as the ability to remember, to relate by analogy or inference, and to categorize and distinguish, are some primary skills which actually bring about comprehension.

PRIOR EXPERIENCE

A student must have a background of experience in order to make sense of the written material. If the experience of the student is not related to the experience of the writer, communication fails and comprehension does not take place. For example, the writings of an advanced research physicist

may be incomprehensible to an adult who has had no experience in this field.[4] This does not mean that students should read only material with which they are familiar. If this is done, no new learning will take place. The goal is to acquire new ideas while relying on past experience.[5]

KNOWLEDGE OF THE CODE OF WRITING

In writing, symbols are used which have relationships to each other. This writing is a code. Knowledge of the code is essential for comprehension. Mankind has devised many types of codes. There are three basic types: pictographic, ideographic, and alphabetic. In pictographic writing pictures of objects are used to communicate. An example of pictographic writing is hieroglyphics. In ideographic writing symbols represent ideas rather than objects. For example, a circle might represent daytime or warmth, whereas in pictographic writing the same shape would represent the sun. Comprehension of both forms depends largely upon the recognition of their basic symbols as representations of objects or qualities in the world. Neither one is based upon the sounds of a spoken language.

The third basic kind of writing code, the alphabetic, in related to and derives from a spoken language. This distinction, which sets the alphabetic or phonetic code apart from other writing codes, is significant in analyzing the process of comprehension in reading English or other alphabetic languages. Assuming a sufficient background of experience, the skill basic for comprehension is a knowledge of the spoken code.

MOTIVATION, PURPOSE AND INTEREST

Motivation and purpose are often overlooked as prerequisites of comprehension, yet they are essential ingredients. The attitude of a reader toward the material he is reading governs his comprehension. If his interest increases, his level of comprehension usually increases, too. If the reader is disinterested in what he is reading, his comprehension will usually decrease.[6] In addition to the subject matter of the written material being of personal interest to the reader, it should stir the imagination, suggest divergent thinking, convergent thinking, challenge beliefs, and test facts. If the material does not in itself have these qualities, which induce thinking and by so doing make the material more interesting, whatever the subject matter, skillful questioning can be used as a substitute.[7] Purpose setting is also an aid to increasing comprehension. More meaning will be derived because it is being sought.[8]

PERCEPTIBILITY

Experiments have shown that certain types of writing are easier to read than others. Black or red ink on soft white paper has the greatest perceptibility. Another factor which helps in perceptibility is the shape of letters. Adequate light is also important.

ADEQUACY AND COMPLETENESS OF CODING SYSTEM

All written codes make use of symbols and devices that either carry meaning directly or show relationships among meaning-carrying symbols. There are symbols that carry meaning directly. They are the vocabulary terms that

have meanings, such as water, cut, crack and softly. They refer to objects or phenomena in the real world, to processes, and to qualities that are measureable or can be agreed upon. Symbols signal relationships and indicate the interconnection of the meaning-carrying symbols.

The order of words and phrases also determine meaning. "The man ran after the dog" means one thing; "the dog ran after the man," means another. Both sentences have the same words, but the meaning is changed by changing the order of the words.

READIBILITY

Readibility is determined by vocabulary difficulty and the length and complexity of sentences. Other linguistic features also influence readibility. Simple sentences can be read at a primary, literallevel or at a higher, figurative level. The sentence, "He took the chair," on the literal level, means that he carried the chair away. On the figurative level this means that he assumed the responsibility of leadership.

UNSTATED MEANINGS

Meanings may be explicitly stated or suggested. The suggested meanings may be more significant than the stated meaning. This element of reading requires the interaction of the reader with the material being read. The writer's meaning is composed of suggested meanings, purposes, attitudes, and organization. Successful comprehension requires the reader to uncover these meanings, to predict outcomes, to see the larger context, and to make comparisons between what is written and what is not.[9]

TIME SPENT ON COMPREHENSION INSTRUCTION

In a recent study investigating the kinds of reading comprehension instruction, Dolores Durkin and her colleagues (1978-1979) arrived at the following conclusions:

1. comprehension instruction occurred less than 1% of instructional time. Out of 4,469 observed minutes of the classroom, comprehension instruction occurred for only 28.
2. Teachers spent most of their time in either noninstructional or transition activities
3. Children spent most of their time writing answers to questions, filling in blanks in workbocks, listening to explanations, or in noninstructional activities
4. 95% of what is done in U. S. classrooms can be attributed to commercially prepared materials.[10]

This study indicates that the comprehension instruction in ordinary classrooms is likely to be dictated by the commercial materials available to the teacher. A close examination of materials which report to teach comprehension reveals that most lessons consist of a short selection followed by several multiple-choice questions that test recall of specific information. Durkin points out that these materials test comprehension rather than teach it.[11]

HOLISTIC AND SUBSKILL INSTRUCTIONAL APPROACHES

Holistic and subskill instruction are two approaches to teaching

reading comprehension. "Holistic instruction is centered around strategies designed to engage students in reading through constant interaction with print."[12] One of the holistic strategies is Sustained Silent Reading. This strategy permits a student to get meaning from print over gradually increasing periods of time. Students are encouraged to get as many ideas out of print as they can. Teachers assist students in seeing reading as a whole by asking questions, such as: "How did you read today?" Did you get a lot done?" "Did the ideas hold your attention?" Students have the choice of sharing what they have read.

Another holistic strategy is the ReQuest method. The name is an acronym for "reciprocal questioning." The students and teacher take turns in asking each other questions about sections which they have read. When the students reach a point where they can predict the outcome, they read the remainder independently and then discuss.

A third holistic strategy is Radio Reading. This strategy uses oral reading to stress the communication of ideas rather than exact pronunciation. Only the reader has his book open; the other students listen. After reading the selection, the reader leads a discussion.

Directed Reading Thinking Activity is another holistic strategy. The teacher's role in this approach is that of an intellectual agitator. He frequently asks the questions: "What do you think?" "Why do you think so?" "Can you prove it?" The students begin by predicting what will happen in the story based on the title of the selection. At various points in the selection, the teacher asks the cycle of question. The student's refine or support their predictions. Discussion follows.

Subskill instruction is "centered around a set of comprehension sub-skills arranged in a logical sequence and taught in a prescribed manner."[13] The teacher's objectives are to teach the subskills, provide practice activities, and provide for the application of these subskills. Some examples of the sub-skills are: defining terms and concepts in context, note facts and significant details, grasps the main idea, follows sequence, notes cause and effect, compares and contrasts, draws inferences, reaches conclusions, applies what is read to solve problems, evaluates material for bias and integrates what he reads with previous experience.

There is considerable controversy between those who favor a holistic approach and those who favor a subskill approach. Advocates of a holistic approach claim that by dividing the reading process into subskills, the reading for meaning aspect is destroyed. On the other hand, reading for meaning seems to work only when subskills are mastered and interrelated. Little if any reported research has indicated that a holistic approach to reading comprehension is more effective than the subskill approach.[14]

QUESTIONS TO GUIDE COMPREHENSION

Teacher questioning is considered by some educators to be the single most influential teaching act.[15] Hilda Taba states: "A focus set by the teacher's questions circumscribes the mental operations which students can perform, determines what points they can explore, and what modes of thought they can learn."[16] Because of this there is a need for higher level questioning. Too much emphasis on literal questioning leads the students to look only for meaning on a literal level. They will not attend to higher levels of thinking.[17]

Research shows that in one study while 77% of the teachers in first and second grades devoted considerable time to teaching comprehension[18] only 12.3% of this time was spent on higher levels of thinking.[19]

Reading comprehension skills may be organized according to a hierarchy. Bloom and his associates first proposed a taxonomy of skills for the cognitive domain in 195[illegible]. There have been many attempts to develop similar hierarchical models in reading comprehension from educators such as Barrett, Ruddell, Spache, and Wallen.[20] These models have in common the assumption that comprehension may be analyzed in terms of separable but related skills, mastery of the less complex will lead to mastery of the more complex.

By using materials of known readability and applying the series of questions, a teacher can stimulate a child's skills in reading comprehension. The various levels of comprehension and appropriate questions for each are as follows:

1. Association. Questions at this lowest level of comprehension are designed to elicit from the child any details of the story that can be recalled.

   Question: "What was the story about?"

   Answer: Answer is correct if any information from the story was provided.

2. Categorization

   The child is required to make a simple categorization. The child was asked to classify a story character in a stereotypic manner and

tell why he classified the character.

Question: "Did you like Anna Marie? Why (or why not)?"

Answer: The child had to use information from the story to justify his response.

3. Seriation.

Questions at this level deal with the interrelationship of details, such as cause and effect or the sequence of events.

Question: "What happened first? What happened next? And then what?"

Answer: A complete summary of major events was not required, but the child had to be able to present any three events in the correct order.

4. Integration

The child is required to combine the various elements of the story into a coherent structure not necessarily given by the story itself. The child may summarize the story or give the main idea.

Question: "What was the problem in this story?"

This question was followed by a parallel question related to the specific story.

"What problem did Nino have?"

Answer: Child had to make interpretations and support them with sound reasons.

5. Extension

The questions are intended to reveal whether the child can apply

her understanding of the story beyond the confines of the immediate story structure. Such questions may call for the child to relate the story to other stories or events, to change his ideas on the basis of new information, or to use his imagination.

Question: "Tell me another way this story could have ended."

Answer: A response was correct if the child supplied a plausible alternate ending which drew upon story information in a reasonable manner, but was clearly different from the actual ending.[21]

THINK-TIME

Research has shown that most teachers only give students one second of think-time before they repeat the question or ask another student the answer.[22] Giving students time to think should be a high priority in reading instruction. Think-time provides a period of private thought, which is valuable in developing reading comprehension. Think-time allows a student to incorporate new material into an existing fund of knowledge. So in addition to mastering the art of questions, teachers must discipline themselves to allow think-time for their students.

There are two times during questioning that think time is critical:

1. after a teacher asks a question
2. after the student has responded.[23]

When teachers increase think-time to five seconds or longer after a question, higher level thinking is elicited. Three changes occur:

1. The length of student responses increases. Students are likely to respond in whole sentences or complete thought units. When think-time is short, students tend to give very brief answers.
2. Appropriate responses increase. When think-time is extended students give more correct responses.
3. Speculative thinking increases. Students have more time to think about incorporating the new knowledge into the current knowledge thereby developing the high level thinking skills.

Allowing extended think-time after a student responds also stimulates higher level thinking. However, teachers are constantly told of the importance

of immediate positive reinforcement when an answer is received, such as a verbal reward. A typical teacher-student exchange is as follows:

Teacher: "Why did Johnny run away?"

Student: "He was afraid."

Teacher: "Yes!" (Good! Fine! Right!)

Unfortunately a teacher's verbal response immediately following a student's response cuts off the student's thinking process. Providing extended thinking time results in the students clarifying and extending their thinking. The following example illustrates the typical interaction between teacher and student when the student is given extended thinking time.

Teacher: "Why did Johnny run away?"

Think-time (1)

Student: "He was afraid."

Think-time (2)

Student: "He knew the dogs could run faster than he could."

Providing extended think-time is often not as easy as it might appear. The University of Maryland Reading Clinic found the following considerations to be of great importance:

1. Prepare yourself. Teachers frequently report a sense of panic if their questions are not answered immediately. Perhaps they asked a poor question or the question does not make sense. Teachers often fill the silence by rewording the question. These strategies only rob the student of think-time. Teachers must be prepared to deal with silence before think-time can be successfully used.

Learning to extend think-time takes practice. Some teachers found that silently counting to five after posing a question helps them become more effective and consistent in using think-time. Another teacher put up a sign reading "Think-Time--Use It!" as a reminder to the teacher and the student.

2. Prepare the student. Students are accustomed to the rapid-fire questioning which is common in classrooms. Some students feel anxious and uncomfortable during the silence when think-time is used.

   It is helpful to explain to students that they will be given time to think and that an immediate answer or response is not necessary. Many students raise their hands simply to get the teacher's attention. It becomes a contest of who can answer the teacher's question first. Instruct the students to use think-time and not hand-waving time to respond to the question. The discussion of the story will be more productive.

3. Start slowly by planning to use think-time during a specific part of the reading lesson. The most appropriate time would be immediately following the reading of a story. Select several inferential and problem-solving questions to be used for discussion. Before you begin the discussion give the following instructions to the students: "These questions require some think-time. You do not have to respond immediately. Think about your answer before you respond."

Think-time stimulates a student's depth of thought and

quality of response. Students have the opportunity to refine and clarify their ideas. Developing thinking skill is one of the goals of a reading teacher. Think-time is certainly worth thinking about.[24]

SUB-SKILL INSTRUCTION

Quality materials for teaching comprehension are not readily available. Most of the available material does not teach comprehension, but tests it. Therefore, teachers need to prepare their own materials. The following are some procedures for developing various comprehension sub-skills:[25]

Developing Skill in Finding the Main Idea

1. State the main idea of a selection.
2. Select the best title from a list.
3. Name a title to fit a given paragraph or longer selection.

Learning to Select Significant Details

1. Indicate which of a series of ideas listed are brought out in a given selection.
2. Tell which of a series of details support the main idea of a selection.
3. Read to note as many details as possible that support a main idea.

Learning to Read to Answer Questions

1. Read to answer questions stated by the teacher.
2. State questions the reader would expect to find answered in a given selection and then check to find the responses after reading the selection.

Making Summaries and Organizing Material

1. Tell which of several summaries best summarizes a paragraph or longer selection.
2. Draw pictures to tell the story of the main events in a story.
3. Arrange pictures in the order in which events pictured by them occurred in a story.

Developing Ability to Arrive at Generalizations and Come to Conclusions

1. Make and guess riddles.
2. Discuss questions like the following after reading a story:
   (a) "Why do you think Ben made his decision to go West?"
   (b) "Under what conditions do you think Ben would have been friendly to the strangers?"
3. List facts heard or read that justify a given generalization or that prove that a given generalization is unsound.

Learning to Follow Directions

1. Observe written directions, such as, "Make one ball yellow. Make the other ball blue."
2. Follow directions that the teacher has written on the chalkboard or on cards, such as, "Get ready for recess" or "Come to the reading circle."
3. Draw a picture from directions given.
4. Write directions for doing or making something.

Improving Ability to Predict Outcomes

1. While looking at pictures of a story, state what the outcome of the story is likely to be.
2. Tell what is likely to happen next in a story or article, without help of multiple-choice questions.
3. Make up endings for stories, orally or in writing.

Developing Skill in Evaluating What is Read

1. Delete from paragraphs or longer selections statements that are not entirely factual.

2. Decide whether a story is real or fanciful and indicate the reason for the answer.[26]

Sequencing

Retelling a Story

All children watch TV. Having children retell the TV series or story is an excellent process for helping students put things into the proper sequence.[27] Have a small group of students (six or less) who have seen the same TV program form a circle. One child begins to tell the story, then at a certain time the teacher says, "next" and another child continues the story. Each child must think of the sequence of events so the story can be told in order.

Recipes

Cookbooks are a natural place to look when studying sequence because recipes follow a systematic progression. Many children enjoy sharing with others their favorite recipes they can make. These can be compiled into a Child's Cookbook.

No-cook recipes such as no-bake cookies may be made in the classroom as a means of helping the whole class become involved in a fun way to practice sequencing.[28]

Comic Strips

Use a comic strip that is not part of a series but complete in itself. Paste the comic strip on a piece of paper, cut out the individual frames. Have the students put these comic picture frames in order.

It is important to remember that the comic frames need not be placed

in the same order that the author did. If the student justifies the placement than it is correct. The mental process is the important goal.

Riddles

Have the children make up riddles such as:

First you wash it,

Second you roll it,

Third you comb it,

What is it?

First you buy it,

Second you wrap it,

Third you give it away,

What is it?

First you turn it on,

Second you adjust it,

Third you watch it,

What is it?

The steps can go to five or six.[29]

SEMANTIC WEBBING

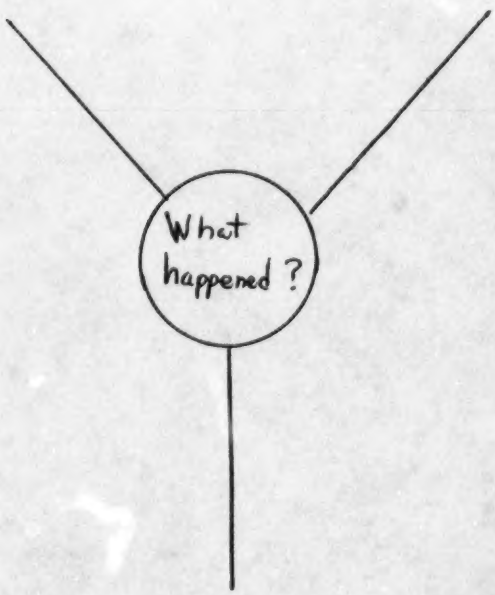
Semantic webbing is helpful because it organizes a subject visually. Many children have difficulties cognitively organizing materials they have heard or read. Teacher-directed semantic webbing can help students see relationships between characters in a story and ideas. Three types of semantic

webbing are: episodal webs, inductive webs, and emotional webs.

Episodal Web

The book read was "The Terrible Thing that Happened at Our House" by Marge Blaine. In it a young girl tells us that she and her brother used to have a "real mother" and a "real father" who took the time to do many things with their children. Then the terrible thing happened--her mother went back to work as a science teacher. This brought about changes in the household which the young girl dislikes. She brings her concerns to the attention of the family and they work together for a solution.

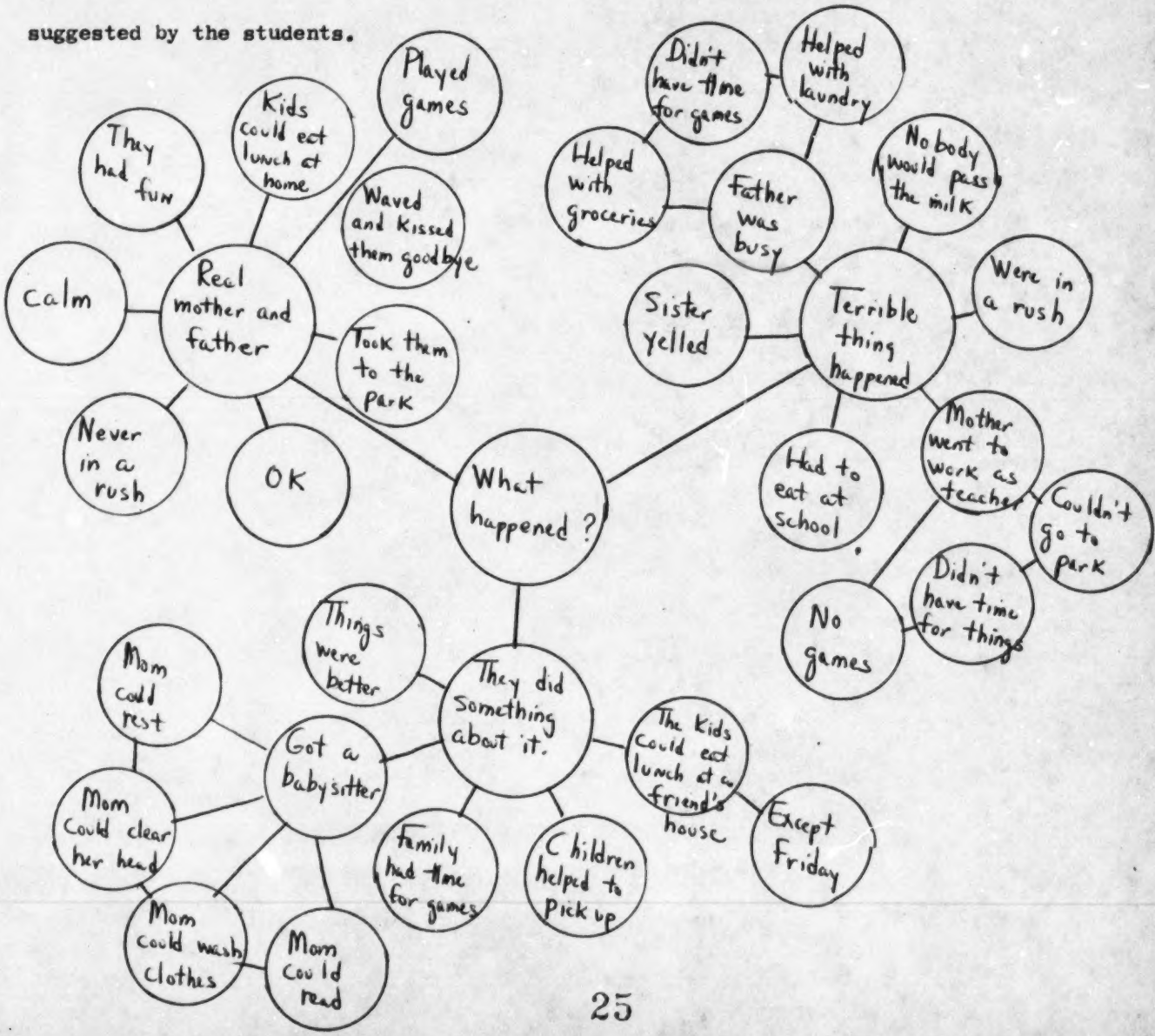
Show the students the beginning structure of the web which would be developed from the story.



After the book was read the children brainstormed about what they thought were the three important sections. These responses were recorded on the chalkboard. They agreed that the three main events were as follows:

1. real mother and father
2. terrible thing happened
3. they did something about it.

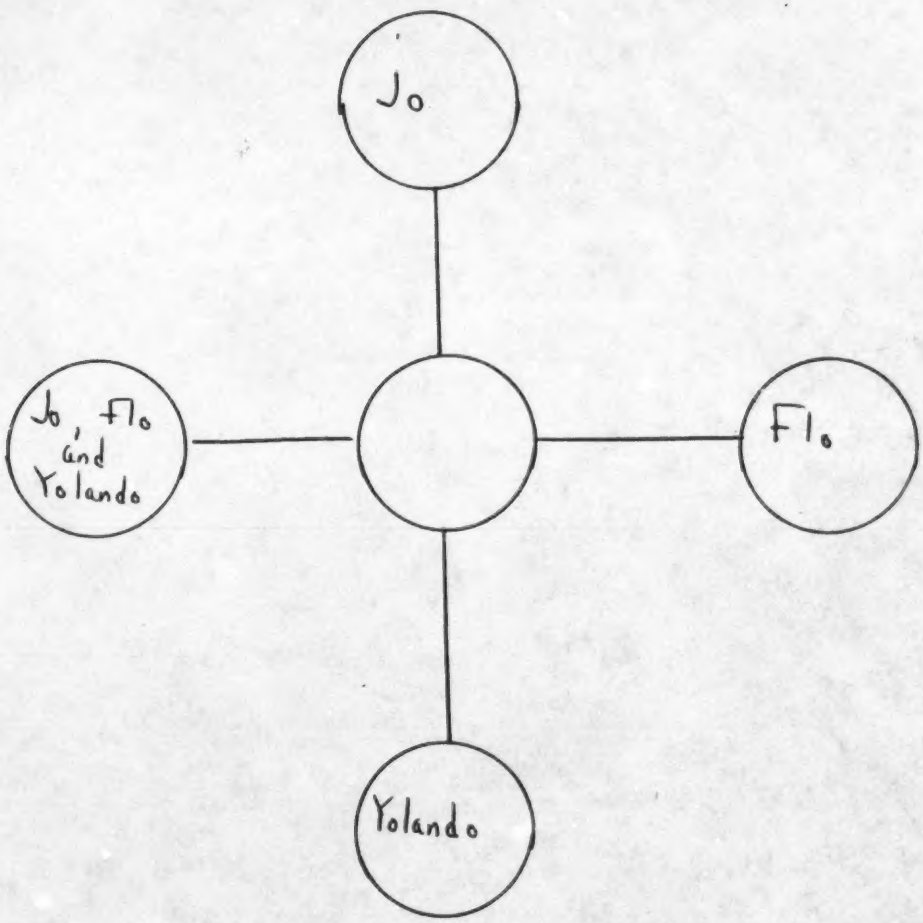
These were written into the web using a color code for each idea and the remainder of the web was developed, an episode at a time from ideas suggested by the students.



The Inductive Web

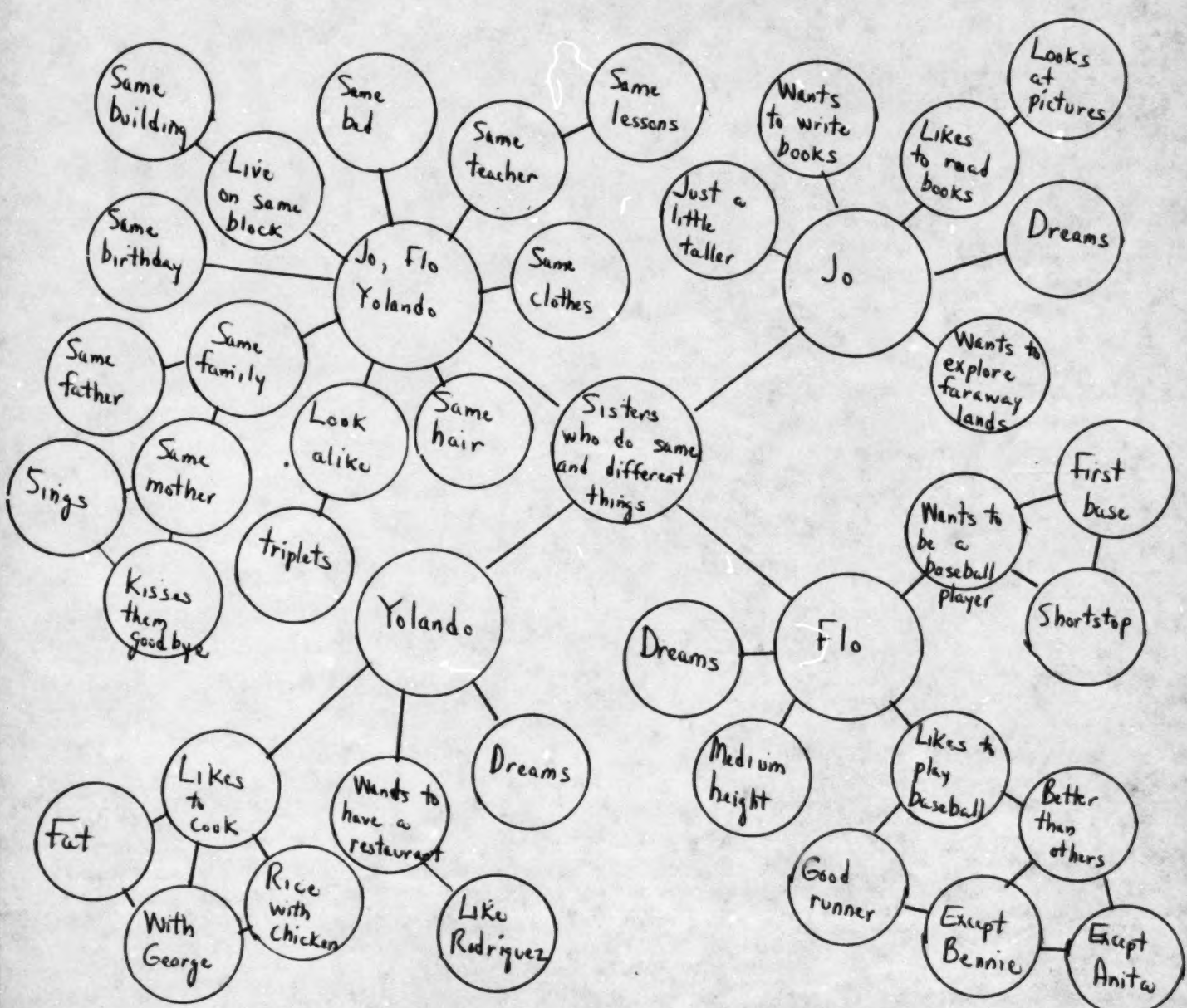
The book read was "Jo, Flo, and Yolanda" by Carol de Poix. It was about triplets who were alike in many ways but were also different.

Present the beginning structure to the children before reading the book.



Ask students to remember important things about each sister and also about common things to all three girls. Write each sections of the web in a different color.

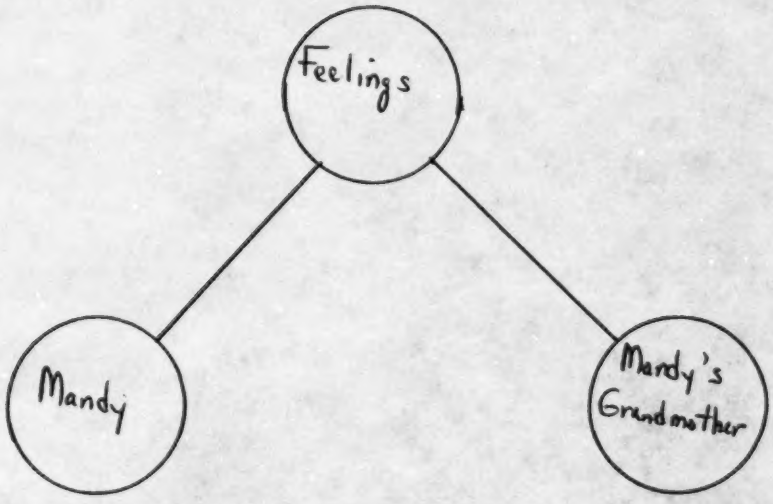
The central element was left blank until the rest of the web had been completed. The students brainstormed 8 or 9 ideas for the center of the web until they decided upon sisters who do the same and different things.

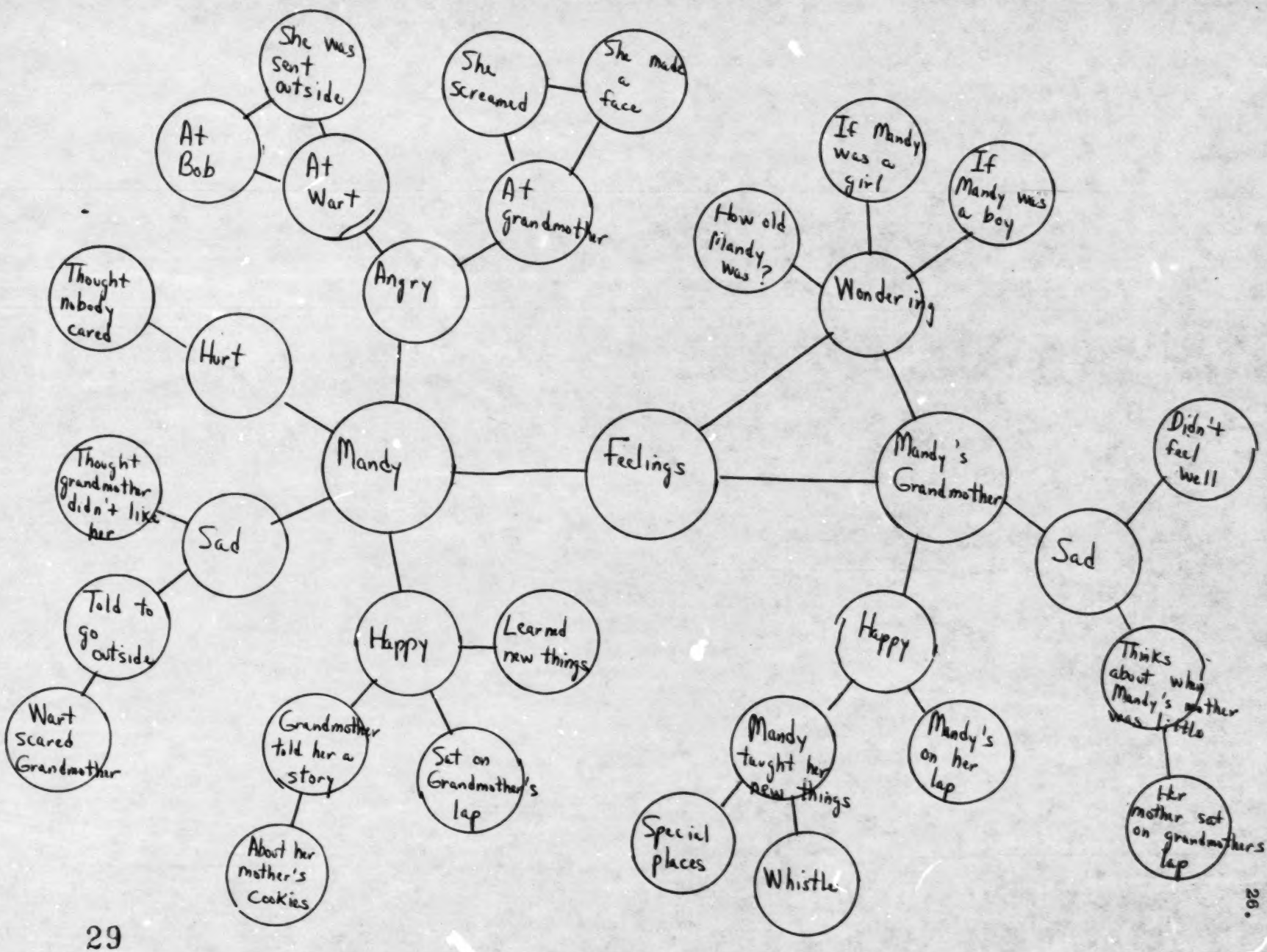


The Emotional Web

"Mandy's Grandmother" by Liesel Moak Skorpen was the third book used. In the book a young girl named Mandy meets her grandmother for the first time. They are both disappointed at first to find the other different than expected. Gradually they learn to love and accept one another.

The students were asked to think about the emotions felt by the character.




Feelings
Mandy
Angry
At Bob
At Wart
She was sent outside
At Grandmother
She Screamed
She made a face
Hurt
Thought nobody cared
Sad
Thought grandmother didn't like her
Told to go outside
Wart scared Grandmother
Happy
Learned new things
Grandmother told her a story
About her mother's cookies
Sat on Grandmother's lap
Wondering
How old Mandy was?
If Mandy was a girl
If Mandy was a boy
Mandy's Grandmother
Sad
Didn't feel well
Thinks about when Mandy's mother was little
Her mother sat on grandmothers lap
Happy
Mandy taught her new things
Special places
Whistle
Mandy's on her lap

29

26.

30

Through the use of semantic webbing children are encourage to:

1. express their ideas
2. perceive relationships
3. organize their thoughts
4. reread--rereading is made more purposeful
5. retell the story with good organization and in remarkable detail.[30]

CONCLUSIONS

Reading is a complex process which depends on the interrelationship of many factors:

1. emotional and physical state
2. environmental influences
3. perceptive skills
4. cognitive skills.

The components which make up each of these four factors are numerous and varied. They all bear a direct relationship to a person's ability to comprehend reading material. Some factors influencing emotional well-being are family problems, peer relationships, self-confidence, and the ability to cope with difficulties which arise on a daily basis. Physical well-being includes factors, such as: proper nutrition, proper rest, and a great variety of physical handicaps like poor vision and poor hearing. Perceptual problems, such as adequate visual and auditory perception skills also influence a person's ability to comprehend written material. Cognitive factors such as general level of mental ability, ability to understand written material on the literal, inferential, and critical levels also effect comprehension. When deciding what course of instruction is best for a particular student, all of these factors must be carefully considered.

Individualization of instructional methods employed is basic to effective teaching and learning. For example, a child who is able to read before he enters first grade obviously does not need to be taught word- recognition skills.

Some others need much instruction and others little instruction. If word recognition skills are over-taught, a student may attend to words as isolated entities. Because he is not being taught to attend to the ideas expressed by the written word, he will not understand the words even though he is able to pronounce them correctly. On the other hand, a student with inadequate word recognition skills will not comprehend the written material either. Whatever time and method devoted to instruction in word recognition skills, it should always be done in a meaningful context. Any possibility of comprehending written material at any level from the literal to the critical level depends on word recognition.

Cognitive skills are interrelated within their own framework. For example, if a student is having difficulty ascertaining the unstated main idea of a selection he must also possess the ability to note details (a literal level skill) and further to note significant details (an evaluative skill). He must also know the meanings of the words in a selection (a literal level skill) and how their meanings affect the ideas expressed in the whole sentences and paragraphs.

To reiterate, deciding where the particular student's specific difficulty lies is essential, as is teaching that skill in a meaningful context.

Since students are sensitive to teacher expectations and most often will not go beyond them, it is essential that teachers stimulate every level of cognition. If students are asked only literal level questions such as who, what, and where, they will attend to only this level of cognition. On the other hand, if asked to reason inductively and deductively, infer, judge and evaluate, they will attend to these levels of cognition. Development of these higher

levels of cognition is often an area neglected in children with reading problems. Emphasis is often placed on word recognition skills, vocabulary, and other literal skills. Reading, which is already a problem area, now becomes a dull, plodding labor which does not hold the student's interest. Since interest is a great motivating factor which leads to comprehension and these higher levels of cognition are certainly the most interesting levels, we must attent to their development, if we are to help a student become motivated to understand written material. We must teach to all of his needs. Another point which needs to be stressed is that all students are capable of these various levels of cognition based on their stage of intellectual development.

Allowing adequate time for a student to think about the written material is essential, if we rely on the premise that reading is a thinking process. We can do this by allowing him adequate time to think about his responses to questions before responding. It is necessary that a student reflect on what he has read in order for him to appreciate the full import of the ideas expressed. If he is allowed this thinking time, it will train him to think about written material even when he is not being questioned.

Semantic webbing, because it encourages a student to explore many possibilities which relate to the ideas expressed by the written material, is also a method for stimulating cognition. It encourages a student to reflect on the written material, relate it to his experiences, and explore all possibilities.

Caution must be used when considering which practice activities to use to stimulate a particular level of cognition. There are in the journals and particularly in texts many practice activities suggested to stimulate cognition.

We have included some of these suggestions. We do not, however, advocate the use of all of these practice activities or the use of any isolated practice activities as a means of stimulating cognitive processes. Teachers must decide which of the activities evaluate cognitive skills and which of them stimulate a particular cognitive skill. Even though an activity may stimulate a particular comprehension sub-skill, to be effective it should be directly related to the selection being read. Also, any effort to stimulate a particular level of cognition should include the following steps: teach, practice and apply.

The Directed-Reading-Thinking Activity approach stimulates various levels of cognition because of its attention to adequate background of experience and its relationship to the selection being read and also because the questions asked encourage a child to exercise and develop all levels of cognition.

Rather than choosing one of the strategies (questioning, think-time, semantic webbing, sub-skill instruction, the Directed-Reading-Thinking Activity, Sustained Silent Reading, Request or Radio Reading) exclusively, they can be combined to more effectively stimulate the cognitive processes. The Directed-Reading-Thinking Activity could be used with a selection. Questioning and think-time could be used as an intrical part of this strategy. When the decision has been made where the weakness lies in a particular student's comprehension skills, sub-skill instruction and semantic webbing could be used. Request, Radio Reading and Sustained Silent Reading cannot effectively be used exclusively for reading instruction mostly because they do not attend to a student's

individual needs. They can, however, be effectively used with the plan suggested above. If a teacher uses this suggested plan, then he is encouraging the student to read for meaning, encouraging the student to see the selection as a whole, and attending to his individual needs in meaningful contexts.

Considering a multiple etiology for reading problems, teaching to a student's individual needs, and presenting lessons in a meaningful context form the keystone to effective reading instruction.

FOOTNOTES

[1]"Reading Comprehension Skills," The Encyclopedia of Education (1971 ed.), vol. 7, p. 373.

[2]William H. Rupley, "The Goal of Reading Instruction: Comprehension of Written Language," (ERIC no. 184-056, Dec., 1980), p. 1.

[3]John J. DeBoer and Martha Dallman, The Teaching of Reading (New York, Henry Holt & Co., 1960) p. 117, 118,

[4]Encyclopedia of Education, vol. 7, p. 374.

[5]Rupley, p. 2.

[6]Encyclopedia of Education, vol. 7, p. 375.

[7]J. P. Guilford, "Frontiers in Thinking That Teachers Should Know About," Elementary Reading Instruction, ed. Althea Beery, Thomas C. Barrett, William R. Powell (Boston, Allyn and Bacon, Inc., 1969), p. 227.

[8]Mary C. Austin and Coleman Morrisson, The First R (New York, MacMillan Co., 1963), p. 38.

[9]Encyclopedia of Education, vol. 7, p. 376.

[10]Maryann Eeds, "Time Spend on Comprehension Instruction," The Reading Teacher, 34 (Feb., 1981), p. 565.

[11]Ibid., p. 566.

[12]Thomas Vacca, "Holistic and Sub-Skill Strategies in Teaching Reading," Journal of Reading, 23 (Mar., 1980),p. 514.

[13]Ibid., p. 515.

[14]Ibid., p. 516.

[15]Amelia Melnick, "The Formulation of Questions as an Instructional-Diagnostic Tool," Reading and Inquiry, 10 (1965 Convention Proceedings) p. 36.

[16]Hilda Taba et al. Thinking in Elementary School Children, Co-op. Research Project No. 1574, San Francisco College, 1964, p. 53.

[17]Frank J. Guszak, "Teacher Questioning and Reading," in Elementary Reading Instruction, ed. Althea Beery, Thomas C. Barrett, William R. Powell (Boston, Allyn and Bacon, Inc., 1969) p. 250.

[18]Morrison and Austin, p. 37.

[19]Ibid., p. 40.

[20]Doris C. Crowell, "AScale of Questions to Guide Comprehension Instruction," Reading Teacher, 34 (Jan. 1981), p. 389.

[21]Ibid., p. 390.

[22]Linda B. Gambrill, "Think-Time: Implications for Reading Instruction," Reading Teacher, 34 (Nov., 1980), p. 143.

[23]Ibid., p. 144.

[24]Ibid., p. 146.

[25]Eeds , p. 566.

[26]DeBoer and Dallman, pp. 131-137.

[27]Homer L. J. Carter and Dorothy J. McGinnis, Teaching Individuals to Read (Boston, D. C. Heath and Co., 1962), p. 115.

[28]Sister Rosemary Winkeljohann, "Reading is Thinking," ERIC 181-409, p. 4.

[29]Ibid., p. 7.

[30]Craig J. Cleland, "Highlighting Issues in Children's Literature Through Semantic Webbing," Reading Teacher, 34 (March, 1981), pp. 642-646.

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